INSECT DISEASE REPORT
USDA FOREST SERVICE/NORTHERN REGION

Report No. 74-28

5200
December 1974

STATUS OF MOUNTAIN PINE BEETLE ON THE BITTERROOT NATIONAL FOREST, MONTANA AND IDAHO 1974

by

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ABSTRACT

Mountain pine beetle activity has increased from about 350 infested trees in 1972 to over 1,200 infested trees in 1974 on the Bitterroot National Forest. The majority of infestation occurs in second-growth, overstocked, ponderosa pine stands in the West Fork Bitterroot drainage. An increase in number of trees killed is expected in 1975. Commercial thinning is encouraged to remove infested trees and improve stand vigor to reduce the infestation to endemic levels.

INTRODUCTION

The mountain pine beetle, *Dendroctonus ponderosae* Hopk., occurs at epidemic level in second-growth ponderosa pine, *Pinus ponderosa* Laws, stands on private and National Forest lands on the Bitterroot National Forest in Montana and Idaho. Trees killed in 1973 were mapped during the annual aerial insect and disease detection survey this year. Groups of infested trees range from five to in excess of 200 trees per group. Largest numbers of infested groups occur on National Forest and privately owned land between Conner, Montana, and Shook Mountain, Sula Ranger District; on private land near Shook Resort, West Fork Ranger District; in Buckhouse, Shannon, and Leaven's Gulches, and Spook and Swamp Creeks, Darby Ranger District; and infested trees ranging from five to 50 trees per group occur from Halfway Creek to Lonely Mountain on the Magruder District in Idaho (Fig. 1).

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Figure 1. Location of mountain pine beetle attacks, Bitterroot National Forest, 1974.

In 1972, approximately 350 infested trees occurred on 600 acres; 675 infested trees on 700 acres in 1973; and 1,200 infested trees on 1,100 acres in 1974 on these Ranger Districts of the Bitterroot National Forest.

To obtain some data on the intensity of the outbreak, a reconnaissance survey was conducted along the lower slopes of Shook Mountain during late August.

SURVEY METHODS

Groups of dead and dying trees, indicative of bark beetle activity, were selected for detailed examination. From these centers a modified variable plot survey was conducted. A wedge prism (20 factor) was used to determine trees to be tallied in each plot. Trees 5 inches in diameter at breast height (d.b.h.) and greater occurring in each variable plot were recorded by species and d.b.h. Trees were categorized into the following classes:

0 - Green; uninfested
1 - 1974 attack; pitch tubes and brood present.
2 - 1973 attack; red foliage, brood absent.
3 - 1972 or earlier attack; foliage fallen.
4 - Pitchout; green foliage, no brood, pitch tubes present.

Data were analyzed using a modified Region 1 ADP sale cruise program. Ratios of 1974 to 1973 and 1973 to 1972 beetle attacked trees were computed.

RESULTS

Ponderosa pine attacked in 1974 was observed throughout the area surveyed. Infested trees occur as scattered singles and in groups up to 25 trees per group. Older attacked trees dating to 1972 and earlier were found adjacent to trees killed in 1974. These two factors indicate that the mountain pine beetle population has been epidemic for several years.

Summaries of tree mortality are provided in Table 1. In the areas surveyed approximately 26 percent of the beetle attacked trees were killed in 1974; 29 percent in 1973; and 16 percent in 1972 and prior. Current infestation levels average 0.7 infested tree per acre. Buildup ratios of old to newly attacked trees were 1:2.4 from 1972 to 1973, and 1:0.8 from 1973 to 1974. Average d.b.h. of infested trees was 9.8 inches in 1972, 9.4 inches in 1973, and 8.7 inches in 1974.

Green stand data shows about 52 percent of the remaining stand is ponderosa pine and 48 percent is Douglas-fir. Habitat type in the area examined is Douglas-fir/snowberry. Stands in this area vary from 60 to 80 years of age.

Pitchouts are scattered throughout the infestation. Approximatley 21 percent of trees attacked resisted beetle attack and were classed as pitchouts.

The majority of broods in trees were larvae and pupae. Some adult beetles had not completed gallery construction or egg deposition; therefore, brood densities are expected to increase over what is now present.

Table 1.--Estimated tree mortality, mountain pine beetle infestation, Sula Ranger District, Bitterroot National Forest, Montana 1974

Plot No.	Acres surveyed	Infested trees/acre						No. ponderosa pine killed			
		1972	Mean d.b.h.	1973	Mean d.b.h.	1974	Mean d.b.h.	1972	1973	1974	Total
1	5	--	--	--	--	1.6	8.5	0	0	8	8
2	5	--	--	0.6	12.3	--	--	0	3	0	3
3	5	--	--	0.6	9.6	0.6	7.6	0	3	3	6
4	5	1.0	12.2	--	--	--	--	5	0	0	5
5	5	--	--	--	--	0.6	5.6	0	0	3	3
6	5	--	--	1.8	8.4	--	--	0	9	0	9
7	5	0.2	9.0	--	--	0.2	11.0	1	0	1	2
8	5	--	--	0.8	6.8	0.4	8.0	0	4	2	6
9	5	--	--	0.8	8.3	0.4	10.0	0	4	2	6
10	5	--	--	0.8	11.8	0.2	8.0	0	4	1	5
11	5	--	--	0.4	8.0	0.4	12.0	0	2	2	4
12	5	--	--	--	--	1.6	7.5	0	0	8	8
13	5	0.2	9.0	1.4	10.1	--	--	1	7	0	8
14	5	0.4	10.0	--	--	--	--	2	0	0	2
15	5	1.2	8.7	--	--	--	--	6	0	6	12
Total or Average	75	1.5	9.8	0.9	9.4	0.7	8.7	15	36	36	87

Parasites and predators were too few to expect enough controlling influence to alter the course of the population before beetle flight in June 1975. Few trees showed evidence of beetle predation by woodpeckers.

DISCUSSION

The mountain pine beetle problem in the Bitterroot drainage is basically related to overstocking in second-growth ponderosa pine stands. This condition is similar to ponderosa pine stands recently infested with mountain pine beetle on the Ninemile Ranger District, Lolo National Forest, northwest of Missoula, Montana (Ciesla and McGregor, 1970; Bousfield, et al., 1973; and McGregor, et al., 1974). Ponderosa pine stands in an overstocked condition generally are more susceptible to attack by mountain pine beetle (Sartwell, 1971). The stand surveyed appears stressed due to excessive between-tree competition.

Although data from the plots do not show many new infested trees, additional new areas containing 1973 and 1974 attacked trees occur in scattered groups throughout the forest. Also, bark beetle brood densities in trees are such that a sufficiently high number will probably survive inter- and intra-specific mortality factors through the winter, emerge, and attack an increased number of trees during 1975.

SUMMARY AND RECOMMENDATIONS

Mountain pine beetle populations have increased to epidemic level on the Bitterroot National Forest since 1972. The majority of infestation occurs in overstocked second-growth stands.

Research data acquired within infested stands in Oregon, and also in the Ninemile drainage near Missoula, indicate that the most viable option for managing second-growth ponderosa pine stands infested with mountain pine beetle is commercial thinning (Sartwell, 1971). Commercial sales to remove infested trees and open up the stand, leaving a mixed species, is encouraged wherever and whenever feasible. Unmerchantable infested trees should be treated by salvage sale or by skidding to a central landing to be burned prior to beetle emergence. These management practices throughout the area will improve stand vigor and reduce or eliminate the incidence of mountain pine beetle.

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